

NON-PUBLIC?: N
ACCESSION #: 9205120294
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Millstone Nuclear Power Station Unit 3 PAGE: 1 OF 4

DOCKET NUMBER: 05000423

TITLE: Reactor Trip During Thermal Backwashing Due to Design Deficiency
EVENT DATE: 04/05/92 LER #: 92-011-00 REPORT DATE: 05/05/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Nelson D. Hulme, Senior Engineer, TELEPHONE: (203) 447-1791
Ext. 5398

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On April 5, 1992, at 1715 hours with the plant at 100 percent power, the reactor was manually tripped due to the loss of the operating condensate pumps. Operations had just completed a backwash of the the E circulating water bay. During the backwash, the E Circulating Water (CW) Pump was stopped and a large amount of debris piled up in front of the E Traveling Screen. After the backwash, the E CW Pump was-restarted and the F CW Pump was stopped in preparation for backwashing the F Bay. Shortly after stopping, the F CW Pump, the E CW Pump tripped. As a result, cooling, to one of the three condenser bays was completely lost. This caused hotwell level to fluctuate, and resulted in reaching the low level trip) setpoint for the condensate pumps.

The root cause for this incident is design is deficiency. The E Traveling Water Screen was not capable of running in the reverse direction while performing a thermal backwash. Additionally, the E

screen did not have sufficient capacity when operated in the forward direction to handle the influx of debris. Divers removed debris from in front of the travel water screens. The traveling screen units are being replaced with units which have 300% of the debris removal capacity.

END OF ABSTRACT

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I. Description of Event

On April 5, 1992, at 1715 hours with the plant in Mode 1 at 100 percent power at a temperature of 587 degrees Fahrenheit and a pressure of 2250 psia, the reactor was manually tripped due to the loss of the operating condensate pumps. The condensate pumps automatically tripped because of a low condenser hotwell level. Operations had just completed a backwash of the the E circulating, water bay. During the backwash, the E Circulating Water (CW) Pump was stopped. After completing the backwash, the E (CW) Pump was started and the F CW Pump was stopped in preparation for performing an F bay backwash. Within 9 minutes of starting, the E CW Pump, it tripped on traveling screen high differential level. Because F CW Pump was not in operation, cooling, water (i.e.: heat sink) to one of the three condenser bays was completely lost. This resulted in a pressure/vacuum imbalance within the condenser, caused hotwell level to fluctuate, and resulted in reaching the low, level trip setpoint for the condensate pumps.

At the time of the trip, operations verified that the Reactor Trip and Bypass Breakers were open, that all control rods were fully inserted, and that neutron flux was decreasing. A Feedwater Isolation was received due to low Average Reactor Coolant system temperature following the trip. An Auxiliary Feedwater actuation occurred as a result of a steam generator low-low level signal. These are normal plant responses following a trip. No additional Engineered Safety Features were required or initiated. The plant was stable in Mode 3 (Hot Standby) and trending to no load Tave at 1735 hours.

II. Cause of Event

The root cause for this incident is design deficiency. The E Traveling Water Screen was not capable of running in the reverse direction while performing a thermal backwash due to structural degradation. Additionally, the E screen did not have sufficient capacity when operated in the forward direction to handle the influx

of debris.

A drawing is attached which shows the backwash lineup. When the E CW Bay was thermally backwashed, the F CW Pump drew water from the F Bay, pumped it through the F Condenser Water Box, around to the E Condenser Water Box, and then out through the stopped E CW Pump. The backwash flushes debris and old mussels from the pump side of the traveling screen units to the screen units. With the E Traveling Water Screen Unit in forward, the debris is swept from the pump side to the front of the traveling water screen units. After the backwash of the E CW Pump Intake was complete, preparations were made to backwash the F CW Pump Intake. When E CW Pump was started, the debris apparently began depositing on the E Traveling Water Screen Unit. The debris from the backwash in addition to that coming from the sea exceeded the debris removal capacity of the screen. A high differential level developed and the E CW Pump tripped.

III. Analysis of Event

This event is reportable in accordance with 10CFR50.73(a)(2)(iv), any event or condition that results in manual or automatic actuation of any Engineering Safety Feature, including the Reactor Protection System. Immediate notifications were made in accordance with 10CFR50.72(b)(2)(ii).

The reactor trip was manually initiated because a reactor/turbine trip due to the loss of condensate flow was imminent. The A train service water pumps are not affected by the loss of E and F CW pumps. Also, there was no effect on the B train lead service water pump since it was aligned to the D bay by procedure. This event posed no significant safety consequences.

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IV. Corrective Action

It was recognized from previous events that the capacity of the Traveling Water Screens Units was inadequate. There is an ongoing project to replace all of the screen units. The A, B, C, and F Traveling Water Screen Units have been replaced with higher capacity screen units. The new units have approximately 300% of the debris removal capacity, of the previous units. The original screen units are made out of carbon steel and have degraded such that reverse operation is not dependable. The new screen units, are stainless

steel and reinforced to ensure reliable operation. All screen units are expected to be replaced by the third quarter of 1992.

Divers removed the debris from in front of the E and F Traveling Water Screens. The procedure for backwashing the CW pump bays was modified to require CW Pumps that had been started following a backwash evolution to be run in parallel with the other CW pumps for 30 minutes prior to stopping the CW Pump on the next bay selected for backwash. Whenever possible, the traveling water screen which is being backwashed will be run in reverse in order to carry debris over the top and into an area where the screen wash is most effective in removing debris.

V. Additional Information

All equipment functioned satisfactorily to bring the primary plant and secondary plant to a stable condition. Following feedwater isolation, the motor-driven feed pump and moisture separator drain pumps continued to operate. This caused the pressure downstream of the feed pump to increase above the setpoint for the first point feedwater heaters thermal relief valves. The relief valves cycled repeatedly resulting in low cycle fatigue. A through-wall crack developed in the inlet piping, to the B First Point Feedwater Relief Valve at the socket weld in a flange connection. The cracked pipe was replaced and blank spool pieces were installed in place of the thermal relief valves for three first point feedwater heaters. The blank spools will remain installed pending an engineering design review to determine the appropriate modifications needed to prevent failure of the relief and relief piping.

Licensee Event Report (LER) numbers 88-024, 89-008, 90-011, 90- 013, and 90-014 are similar in that a traveling water screen high differential level caused CW pump trips that resulted in a plant trip. This is the first event that can be directly attributed to debris buildup due to backwash resulting in clogging of the travel water screens.

EIIS Codes

Systems Components

Circulating Water System - KE Pumps - P
Traveling Water Screens - SCN
Condenser - COND

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Figure 1 omitted.

ATTACHMENT 1 TO 9205120294 PAGE 1 OF 1

NORTHEAST UTILITIES

NU The Connecticut Light And Power Company
Western Massachusetts Electric Company
Holyoke Water Power Company
Northeast Utilities Service Company
Northeast Nuclear Energy Company

General Offices - Selden Street
Berlin Connecticut

P.O.BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203)665-5000

Re: 10CFR-50.73
May 5, 1992
MP-92-467

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Reference: Facility Operating License No. NPF-49
Docket No. 50-423
Licensee Event Report 92-011-00

Gentlemen:

This letter forwards Licensee Event Report 92-011-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(iv), any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace
Director, Millstone Station

SES/NDH:ljs

Attachment: LER 92-011-00

cc: T. T. Martin, Region I Administrator
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2
and 3
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3

*** END OF DOCUMENT ***
